What is claimed is:

1. Device for depositing in particular crystalline layers on one or more in particular crystalline substrates in a process chamber (1), which has a ceiling (2) and a heated floor (3), vertically opposite the ceiling, for receiving the substrates (4), with a gas inlet member (5), which forms gas inlet zones (6, 7) disposed vertically one above the other for introducing at least a first and a second gaseous starting material separately from one another, which starting materials flow in a horizontal direction together with a carrier gas through the process chamber (1), the first starting material being a hydride and the second starting material being a metalorganic compound, the stream of gas being homogenized and the starting materials at least partially pre-decomposed in an inlet zone (EZ) directly adjacent the gas inlet member (5), the decomposition products of which starting materials are deposited on the substrates (4) in a growing zone (GZ) adjacent the inlet zone (EZ), while the stream of gas is steadily depleted, characterized by three gas inlet zones (6,7,8) of the gas inlet member (5) disposed vertically one above the other, the first starting material being introduced through a gas inlet zone (6) neighboring the floor (3) of the process chamber (1) and a gas inlet zone (8) neighboring the ceiling (2) of the process chamber (1) and the second starting material being introduced through a middle gas inlet zone (7) between the one neighboring the floor and the one neighboring the ceiling, to reduce the horizontal extent of the inlet zone (EZ).

2. Method for depositing in particular crystalline layers on one or more in particular crystalline substrates in a process chamber (1), which has a ceiling (2) and a heated floor (3), vertically opposite the ceiling, on which the substrates (4) lie, in which method at least a first and a second gaseous starting material are introduced into the process chamber (1) through gas inlet zones (6, 7) of a gas inlet member (5) disposed vertically one above the other, which starting materials flow in a horizontal direction together with a carrier

gas through the process chamber (1), the first starting material being a hydride and the second starting material being a metalorganic compound, the stream of gas being homogenized and the starting materials at least partially pre-decomposed in an inlet zone (EZ) directly adjacent the gas inlet member, the decomposition products of which starting materials are deposited on the substrates (4) in a growing zone (GZ) adjacent the inlet zone (EZ), while the stream of gas is steadily depleted, characterized in that, to reduce the horizontal extent of the inlet zone (EZ), the first starting material is introduced through a gas inlet zone (6) neighboring the floor (3) of the process chamber (1) and one neighboring the ceiling (2) of the process chamber (1) and the second starting material is introduced through a middle gas inlet zone (7) between the one neighboring the floor and the one neighboring the ceiling.

3. Device or method according to Claim 1 or 2, characterized in that the first starting material is AsH_3, PH_3 or an NH_3.

4. Device or method according to one of the preceding claims, characterized in that the decomposition product of the first starting material is an element of the group V or VI and the decomposition product of the second starting material is an element of the group III or II.

5. Device or method according to one of the preceding claims, characterized in that the first and/or the second starting material is respectively introduced into the process chamber (1) by means of a carrier gas through the gas inlet zone (6, 7, 8) associated with it.

6. Device or method according to one of the preceding claims, characterized in that the first starting material is introduced into the process chamber in a concentration that is 100 to 5000 or 1000 to 5000 times higher than the second starting material.

7. Device or method according to one of the preceding claims, characterized in that the vertical height of the gas inlet zone (6, 8) neighboring the floor or the ceiling is less than the vertical height of the middle gas inlet zone (7).

8. Device or method according to Claim 7, characterized in that the sum of the two heights of the gas inlet zones (6, 8) neighboring the floor and the ceiling is less than the height of the middle gas inlet zone (7).

9. Device or method according to one of the preceding claims, characterized in that the floor (3) of the process chamber (1) forming a substrate holder is heated from below.

10. Device or method according to one of the preceding claims, characterized in that the process chamber (1) has an axial symmetry, the gas inlet member lying at the center (5).

11. Device or method according to Claim 11, characterized in that the substrate holder (3) is rotationally driven about the center of the process chamber (1).

12. Device or method according to either of Claims 10 and 11, characterized by a multiplicity of circular disk-shaped substrate carriers (9), which are disposed next to one another in the circumferential direction on the substrate holder (3), are rotationally driven with respect to the substrate holder (3) and carry one or more substrates (4).

13. Device or method according to Claim 12, characterized in that each substrate carrier (9) carries seven circular substrates (4) and altogether six or more substrate carriers (9) are associated with the substrate holder (3), located close to one another in uniform circumferential distribution.

14. Device or method according to one of the preceding Claims 10 to 13, characterized in that the zone of the maximum growth rate (10) lies radially within the annular growing zone (GZ) in the marginal region of the inlet zones (EZ).

15. Device or method according to Claim 14, characterized in that the diameter of the inlet zone (EZ) is less than the radial extent of the growing zone (GZ).